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# THEOPHRASTUS AND ARISTOXENUS: CONFUSIONS IN MUSICAL METAPHYSICS

ANDREW BARKER

*Abstract* Theophrastus frag. 716 attacks the thesis that differences between musical pitches are quantitative. Most of its fire-power is directed at harmonic theory in the ‘mathematical’ or ‘Pythagorean’ style, but one short passage (lines 108 ff.) is not. Previous commentators have identified its target as Aristoxenus; but I argue that Theophrastus’ account does not fit Aristoxenus’ position, and that we should look for his target in the work of earlier ‘empirical’ theorists. After reviewing and rejecting various possibilities, I tentatively suggest that Theophrastus’ conception of the empiricists’ standpoint may originate in a plausible but probably mistaken interpretation of *Republic* 531a-b. I then argue that so far from criticizing Aristoxenus’ ideas, Theophrastus’ polemic makes substantial use of them. Finally, I explain how this phase of his discussion returns us to the intriguing questions from which his whole anti-quantitative tirade began.

At the beginning of frag. 716, a long passage quoted by Porphyry, Theophrastus speaks of a movement in or of the soul which he calls a κίνημα μελωδητικόν, a movement productive of melody; and at the end of the fragment he adds that music itself, in its essential nature, is a special kind of movement of the soul, a κίνησις τῆς ψυχῆς. Now when a κίνημα μελωδητικόν takes place, he says, the soul can, if it wishes, do something which he evidently regards as extraordinary. It can transform this inner movement into something externally perceptible, a pattern of sounds, by expressing it through the voice in song; and it can do this with remarkable accuracy, ‘turning’ or perhaps ‘steering’ the voice (the verb is τρέπειν) in precisely the ways that it wishes, ‘in so far as it is capable of turning (or ‘steering’) something non-rational’ (7-9).<sup>1</sup> Theophrastus is clearly onto something here, which seems to have struck rather few other authors so forcefully.<sup>2</sup> A few people are ‘tone dumb’, as a friend of mine used to put it; but most of us can indeed ‘steer’ our voices around the notes of any tune we have in our heads, hitting just the notes we imagine and no others, and in general we haven’t the least idea how we do it. When one begins to think about it, it seems a pretty astonishing trick, and it cries out for an explanation.

<sup>1</sup> All references to frag. 716 are by the line numbers of Fortenbaugh’s edition (*Theophrastus of Eresus. Sources for his Life, Writings, Thought and Influence*, ed. and trans. W. W. Fortenbaugh et al. (Leiden 1992), 2 volumes).

<sup>2</sup> An exception is Ptolemy, who says that our ruling principles (τὰ ἡγεμονικά) find and lay hold on the appropriate pitches ‘in an astonishing way’, θαυμαστώς, *Harm.* 9.12.

‘Some people,’ Theophrastus goes on, ‘tried to account for the soul’s accuracy by reference to numbers, asserting that the accuracy of the intervals arises in accordance with the ratios between numbers’ (10-11). The theoretical approach which represents musical intervals as ratios is of course well known; it is associated in the first instance with the Pythagoreans, but by the later fourth century had passed into much wider currency. By no means all exponents of what Aristotle calls ‘mathematical harmonics’ were Pythagoreans; and the theses about musical ratios that were developed within this science were also picked up and exploited outside the musical domain by philosophers and scientists in several fields and of several doctrinal persuasions. There was plenty of this kind of talk in the air. But Theophrastus is unusual in claiming that ‘some people’ set the theory of musical ratios to the task of explaining our capacity to sing intervals accurately; and there is no independent fourth-century evidence to confirm that what he says is true.<sup>3</sup> Be that as it may, the thought he seems to attribute to them is that singing involves something like subconscious mental arithmetic. The soul can steer the voice to just the pitches it envisages because they are precisely defined by numbers; and the soul, presumably, can be relied on to get its secret arithmetic right.

But Theophrastus will have none of this; and the main part of this extensive fragment is devoted to a set of complex and ingenious criticisms of these theorists’ position. He does not focus on its psychological aspect, but on the underlying thesis that differences in pitch are quantitative, pitches being quantitative values of some variable property attached to sounds, conceived as physical events, and that the relations between pitches are properly represented as ratios of numbers. After demolishing various versions of this thesis to his own satisfaction (17-80), he presents very sketchily his own alternative view, that pitch is a *qualitative* attribute of sound. High pitch, for instance, is a qualitative *ιδιότης* of a treble note, and being high-pitched is more like being pink or green than like being big or numerous or travelling swiftly (80-90, cf. 105-07).

All that is by way of introduction, to offer a taste of Theophrastus’ main agenda. I shall not examine any of the arguments in the passages I have so far outlined; I have discussed them elsewhere and have nothing new to say about them.<sup>4</sup> But when Theophrastus has completed his assault on the views of these mathematical theorists, he turns his attention, in a much more abbreviated discussion, to another quite distinct way of explaining how pitches differ. According to this approach, he says, it is the *διαστήματα* that are the causes of these differences. The remark is in some respects enigmatic, but there can be no real doubt about

3 The only fairly clear exposition of such a theory known to me is in the passage of Ptolemy which includes the comment mentioned in n. 2 above, *Harm.* 9.6-15. Here the pitch of a note sounded by the voice is said to be determined by the distance between the point on the windpipe where an impulse of breath originates and the point at which it strikes the outer air. The position of the latter is fixed; the former is moved closer to it or further away through the action of the ἡγεμονικά, which ‘find and grasp, astonishingly and easily, as though with a bridge [i.e., the moveable bridge of a monochord], the places on the windpipe from which the distances to the outer air will produce differences of sounds in proportion to the amounts by which the distances exceed one another’. Ptolemy may have found this theory, like much else in *Harm.* I.3, in a work of the fourth or third century BC; but there is nothing to prove it.

4 Andrew Barker, ‘Music and mathematics: Theophrastus against the number-theorists’, *Proceedings of the Cambridge Philological Society* n.s. 23 (1977) 1-15, and ‘Theophrastus on pitch and melody’, in *Theophrastus of Eresus: on his life and work*, ed. W. W. Fortenbaugh *et al.*, Rutgers University Studies in Classical Humanities 2 (New Brunswick 1985) 289-324. For a more recent study see C. M. J. Sicking, ‘Theophrastus on the nature of music’, in *Theophrastus: reappraising the sources*, ed. J. M. van Ophuijsen and M. van Raalte, *Rutgers University Studies in Classical Humanities* 8 (New Brunswick 1998) 93-142.

its general tenor. He is evidently referring to ideas characteristic of the main rival to mathematical harmonics in the Greek tradition, which rejects the representation of musical intervals (διαστήματα) as ratios, and tries to describe and distinguish them in language that reflects the guise in which they present themselves to our ears. It too is quantitative, in its own way, which is probably why Theophrastus included it in his diatribe; it represents intervals as quasi-linear ‘distances’ of various sizes between points of pitch. Because these ‘distances’ (specified as semitones, tones and so on) exist in a dimension accessible only to hearing, and are assessed exclusively by ear, Aristotle calls this style of harmonic theorising ‘harmonics based on hearing’ (*An. post.* 79a1-2, cf. *Metaph.* 1053a14-16); for convenience, though not perhaps entirely accurately, I shall call it ‘empirical harmonics’.

Commentators have regularly supposed that the theorist against whom Theophrastus is mounting this new assault is the best known of all Greek exponents of empirical harmonics, Aristoxenus, who was a prominent member of the Lyceum, along with Theophrastus himself, in Aristotle’s later years. In the past I have taken that view myself; but I have begun to wonder whether it can really be sustained. Here I shall offer arguments which suggest that it cannot. Next I shall make an attempt (which will not in the end be conclusive) to identify the real target of Theophrastus’ criticism; after that I shall speculate briefly about whether there are indications in the passage that although Theophrastus was not criticising Aristoxenus, he was nevertheless acquainted – as we would surely expect – with some features of his work. Finally I shall try to clarify the way in which certain aspects of this phase of Theophrastus’ argument bring us back, full circle, to issues raised at the beginning of the fragment.

We shall start by reviewing the main part of this stretch of the text, lines 108-19. It begins as follows. ‘Nor are the διαστήματα the causes of the differences and thus their principles, as some people say, since even when these are left out the differences remain’ (108-09). Two preliminary comments may be helpful. First, διαστήματα, in musicological contexts, are intervals. If we think of notes with different pitches as placed at different points on a linear continuum, the διαστήματα will be the spaces or distances that separate them. Secondly, throughout the fragment, when Theophrastus writes of ‘the differences’ he means differences in pitch and in nothing else; and as the present sentence makes clear, he is concerned especially with the state of affairs that ‘causes’ the difference between a high-pitched and a low-pitched sound. Earlier parts of the fragment, and later parts of this passage itself, also bring out the fact that he is focussing above all on the causes of the special kind of pitch-difference that there is between the notes of a melody. What is it that *makes* one of a tune’s notes higher or lower than another?

It is not, he says, the διάστημα between them that is the cause of the difference. This seems to mean that it is not *because* the notes are separated by some ‘distance’ on the continuum of pitch that their pitches differ. Presumably, then, some theorist or theorists had argued that these διαστήματα are indeed in some sense the causes. Why does Theophrastus disagree? Because ‘even when these (the διαστήματα) are left out, the differences remain’. As it stands this is a dark saying, but the next sentence contains a γάρ which seems to promise an explanation.

For if something arises when certain things are left out, these things are not causes of its being, not, that is, as producing it, but as not preventing it. For the unmelodic is not to be reckoned the cause of the melodic on the grounds that the melodic would not arise unless the unmelodic were rejected; nor would anything else productive of knowledge arise unless ignorance, the opposite of knowledge, were rejected. For ignorance is not the cause of knowledge by being something existent (ὥς ὄν), but by being something which, if it is rejected, does not prevent it; and neither, therefore, are the διαστήματα causes of the melody by producing it, but by not preventing it. For if at the same time one also sang the intervening positions in an unbroken continuum, surely one would emit an unmelodic sound? Thus, granted that if certain things were not rejected, the unmelodic (ἐκμέλεια) would arise, the melodic (ἐμμέλεια) does not arise from their being left out, just because they would prevent it if they were not left out. (109-19)

Theophrastus' mode of expression and line of thought here are scarcely lucid, and there are special problems about the allusions to knowledge and ignorance in lines 112-15. I do not propose to tackle them today.<sup>5</sup> On any reading, the 'knowledge-and-ignorance' references have only the force of an illustrative example or analogy, and the general run of the argument can be reconstructed without them. The passage's principal thesis is roughly as follows. If we have an item of some sort – call it X – which will come into being only if things of some other sort, Y's, are 'left out' or 'rejected', then these Y's are not the causes of X. If their presence would prevent X from arising, and their absence removes an obstacle to X's occurrence, it cannot be they which, by their existence, are the 'productive causes' of X, its αἰτία τοῦ εἶναι ...ὥς ποιοῦντα (110). The last sentence seems to go a step further, if my translation is on the right lines. Even if X cannot arise unless the Y's are rejected or omitted, nevertheless their *omission* cannot be regarded as the cause of X any more than their existence can. The idea, I suppose, is that the omission of the Y's is only a *necessary* condition of X's occurrence; when the Y's are left out we still need something else, a genuine productive cause, to ensure that X actually arises.

One can make some sense of this, considered as a piece of abstract reasoning about causation. It is when we address Theophrastus' way of applying it to the cases of sound and melody that we stumble on a difficulty. The melodic, ἐμμέλεια, he says, will not arise unless we get rid of the unmelodic, ἐκμέλεια. That sounds unobjectionable, in a vague kind of way; but it is not at first sight obvious what it has to do with the thesis that the διαστήματα are not the causes of pitch-differences, or, as he puts it in lines 115-16, of the μέλος. The answer turns up in the penultimate sentence, couched as a rhetorical question. 'For if at the same time one also sang the intervening positions κατὰ τὸ συνεχές, continuously, surely one would emit an unmelodic sound?' The point, unquestionably, is that in singing a melody we sing first one note, then another at a different pitch, and we do not join them up by slithering through the whole continuum of pitches that lies between the two. Everything that intervenes between them has to be 'rejected' or 'left out'; otherwise the result would be unmelodic, and, we might add on Theophrastus' behalf, the distinct pitches of the two notes in question would be obscured.

<sup>5</sup> For discussion see Sicking, 'Theophrastus on the nature of music', above n. 4, though I do not think that the text of the passage is as seriously disturbed as he suggests.

Observations of this sort about singing are common in Greek musical writings from Aristoxenus onwards. Song is regularly distinguished from speech, and also from such things as the lowing of cattle and the howling of wolves, by reference to the fact that it proceeds by leaping from point to point across distances in pitch without touching down in the intervening space, and without sliding audibly through the pitch-regions between them.<sup>6</sup> To that extent Theophrastus is on firm ground. What seems extraordinary is that he apparently identifies the διάστημα, the interval between two pitches, with what would be the audible *contents* of this intermediate space if it were un-melodically filled in. The διαστήματα, he says, cannot be the productive causes of μέλος, because if one were to utter, κατὰ τὸ συνεχές, all the μεταξύ τόποι as well, the result would be unmelodic. This also gives an interpretation of the opening sentence. The διαστήματα cannot be the causes of the differences between pitches, because those differences continue to exist even where, as in the singing of a melody, the διαστήματα are left out. It is now clear that he means by this that the continuum of pitches between the differently pitched notes is 'left out' in the sense 'not allowed to sound'. To repeat, he is treating a διάστημα as the sonorous *content* of the gap between two pitches, and not simply as a gap or distance of some size. Lines 116-18 show that it is this content, not the space that it fills, that must be omitted if the distinct pitch-differences characteristic of melody are to appear.

That is all very well, but it is hard to identify any Greek theorist who treats διαστήματα in this way; there are in fact strong grounds, as we shall see, for thinking it impossible. Certainly Aristoxenus does not. Notes, according to his account, lie at pitches separated by intervals or distances, διαστήματα; but in a long and carefully articulated passage of the *Elementa harmonica* (8.13-10.24) he lays great emphasis on the very fact on which Theophrastus also insists, that the singing voice moves from note to note across διαστήματα without sounding the pitches in between. A διάστημα, on his account of the matter, is not a continuum of pitches; it is simply a distance or space *between* pitches. A little later in the text he defines it like this. 'A διάστημα is that which is bounded by two notes that differ in pitch. To put it briefly, a διάστημα seems to be a difference between pitches, and a space capable of receiving notes that are higher than the lower of the pitches bounding the interval, and lower than the higher' (*El. harm.* 15.24-31). It is a 'space capable of receiving notes', a τόπος δεκτικὸς φθόγγων, and it is absolutely not identical with the notes or pitched sounds that it might under some circumstances 'receive'. On this understanding of διαστήματα, it would be nonsense to say that they are 'left out' when the singing voice moves from note to note.

To judge by this evidence, if Theophrastus intended his argument as a refutation of Aristoxenus, he has missed his target by a mile. Perhaps, however, he wants to suggest that Aristoxenus holds other views which commit him to the position under attack even though he does not recognise the fact; in effect he would be accusing him of a serious inconsistency. Suppose he thought that Aristoxenus treated διαστήματα, however these are conceived, as the causes of differences in pitch in the sense that he himself had in mind, what he calls their 'productive' causes. He might then have argued that since empty spaces cannot in themselves be the productive causes of anything, the only intelligible way of interpreting Aristoxenus'

<sup>6</sup> See especially Aristoxenus *El. harm.* 8.13-10.10; cf. Nicomachus *Harm.* 238.18-239.17, and Ptolemy *Harm.* 9.29-10.28, with the elaborate discussion of Porphyry *In Ptol. harm.* 81.18-90.2.

position will involve putting something substantial, as it were, into those spaces, something capable in principle of being a cause; and that could only be an actual sound-continuum running through the relevant range of pitch. But if that were his line of reasoning he would once again have been hopelessly at sea, since the premise from which the inference begins is false. Nowhere does Aristoxenus say anything to suggest that διαστήματα are Theophrastan ‘causes’ of pitch-differences. On the contrary, the sketchy definition of pitch which he gives at *El. harm.* 12.1-3 makes no reference to διαστήματα at all; and more generally and more importantly, he seems wholly uninterested in causal questions of the sort that Theophrastus is raising. As he repeatedly emphasises, he is concerned only with the guise in which notes, intervals and so on present themselves to perception, their nature κατὰ τὴν τῆς αἰσθήσεως φαντασίαν, and speculations about their causes, of a sort that a physicist might pursue, are wholly irrelevant to his purposes.<sup>7</sup>

So far, then, my conclusion is that the position Theophrastus seems to be attacking is a very odd one, and that nothing like it is to be found in Aristoxenus. I want to try a different tack. I shall ask first whether there is any evidence that anyone else ever adopted a theory of the sort that Theophrastus is criticising, or that any context of discussion existed in which it might have played a part; and secondly whether there are indications in this text that Theophrastus nevertheless knew Aristoxenus’ work. Rather than criticising it, is he perhaps exploiting aspects of it in the service of his own argumentation? Given that these two individuals were both eminent figures in the Lyceum at the same time, it is scarcely believable that they were wholly ignorant of one another’s activities; and given that Aristoxenus was by far the most significant and most insistently self-publicising harmonic theorist of the period, it would be extraordinary if Theophrastus, by comparison an amateur in the field, had simply ignored him when he turned to the subject himself. In discussing these questions we need examine Theophrastus’ text no further than we have already. I shall reserve the final part of the passage for brief consideration at the end.

Is there anywhere, then, in fourth-century or earlier thought, that we might locate a theory which claims *both* that what makes one pitch different from another is the διάστημα between them, *and* that this διάστημα is constituted by the continuum of intervening pitches? Such a theory would appear to be treating this intervening content as that which, as it were, holds the two pitches apart. Now we know that empirically-minded theorists before Aristoxenus were interested in the question how closely two notes or pitches can be packed together without becoming identical or indistinguishable. When should we consider two notes as next-door neighbours between which there is no space into which another note can fall? What is it that distinguishes their case from that in which the two notes have become the same and sound in unison, and on the other hand from one in which there is room for another note or notes inside the gap between them?

Such questions are associated with the task of identifying an interval that can be treated as ‘elementary’, in the sense that it is the unit of measurement of which all other intervals are multiples. Aristoxenus talks about earlier theorists who represent the continuum of pitch in a linear diagram divided into quarter-tones, and who then map the notes of a scale onto it,

<sup>7</sup> Among the most significant passages are 8.13-10.10, 12.4-32, 32.10-33.1. For the phrase κατὰ τὴν τῆς αἰσθήσεως φαντασίαν (and a variant, using πρὸς instead of κατὰ) see 8.23, 9.2-3, 48.22.

positioning them so many quarter-tones apart.<sup>8</sup> These quarter-tones or ‘enharmonic dieses’ are the minimal units by reference to which all other intervals are measured, and there is no identifiable interval smaller than a quarter-tone. For reasons that need not detain us here, Aristoxenus dislikes this approach, and rejects the idea that a sequence of points spaced by quarter-tones can properly represent a series of notes that are ‘successive’ (ἐξήης) with one another. But it is clear that these theorists’ quarter-tones are, as it were, Aristoxenian, not Theophrastan. They are minimal gaps or spaces between pitches, not ones conceived as filled up with sonorous content that holds the notes apart. Similar notions are mentioned by Aristotle, who should be understood, I think, as speaking of these tiny intervals not as theoretical minima, but as ones that are the smallest gaps that the ear can discriminate, and which can therefore function, for practical purposes, as the units in terms of which larger διαστήματα can be measured.<sup>9</sup>

None of this material allows us to pick out the theorists whom Theophrastus had in his sights, and there are, I think, only three passages in surviving texts from which one might try to weave some substance for his target. One is an enigmatic remark by Aristoxenus himself. Near the beginning of the *Elementa harmonica*, when he is setting out the programme of subjects that the science of harmonics should address, the first topic on his list is the distinction between the different ways in which the voice can move from pitch to pitch. We have already sketched out the distinction he has in mind, between ‘diastematic’ or ‘intervallic’ movement on the one hand, the movement proper to song, and ‘continuous’ movement on the other, which is characteristic of speech. But that discussion comes later. All he says here is that if the distinction is not properly grasped, it will be hard to say what a note is; and something clear and accurate must be said about that if we are not to fall into the error of ‘Lasus and some of the followers of Epigonus, who thought that a note has breadth (πλάτος)’ (*El. harm.* 3.18-24).

This incidental comment has caused a good deal of scholarly head-scratching.<sup>10</sup> The *Suda* credits Lasus of Hermione with writing the first λόγος, perhaps ‘essay’ or ‘treatise’, περὶ μουσικῆς, and maybe he did. Around 500 BC would be plausible as the date of the earliest prose discussion of such a topic, and there are some very slight traces elsewhere of a tradition that Lasus had something to say about issues relevant to harmonics.<sup>11</sup> But if he did write such a λόγος we know nothing definite about its contents. Epigonus is usually thought to be roughly contemporary with Lasus, and he is said to have invented an instrument with 40 strings, possibly a kind of zither, as West (following Curt Sachs) suggests;<sup>12</sup> but there are doubts about both the date and the instrument. We are entirely in the dark about any

<sup>8</sup> See for instance *El. harm.* 27.34-28.10, 53.2-9.

<sup>9</sup> See *Metaph.* 1053a12-18, with the context provided by 1052b20-1053a24; cf. 1087b33-1088a4. It seems clear that the diesis must be one of the μέτρα which, in the language of these passages, are ἀδιαίρετα πρὸς τὴν αἰσθησιν. A related passage of the *De sensu* (445b29-446a4) poses special problems, to which I shall return.

<sup>10</sup> For a small selection of opinions, see Henry S. Macran, *The Harmonics of Aristoxenus* (Oxford 1902) 226-27; R. Da Rios, *Aristosseno: l'Armonica* [the translation appended to her edition, *Aristoxeni Elementa Harmonica* (Rome 1954)] 7 n. 3; Andrew Barker, *Greek Musical Writings*, vol. 2 (Cambridge 1989) 128 n. 12; M. L. West, *Ancient Greek Music* (Oxford 1992) 225.

<sup>11</sup> Theo Smyrn. 59.4-12, Martianus Capella 9.352.

<sup>12</sup> See West, *Ancient Greek Music*, above n. 10, 78-79, 225-26, with the references given there.



theoretical views he may have expressed, or what could have been involved in being ‘one of the Epigoneioi’.

Despite these uncertainties, we can make a plausible guess about the general context of thought in which it might have seemed plausible to attribute ‘breadth’ to notes. Abstractly considered, if notes are conceived as pitch-points on a continuum, there is no limit to the number of notes that can be fitted within any span of pitch, since a point occupies no space. This is a fact recognised and exploited for his own purposes by Aristoxenus. But there are two senses – quite different ones – in which there *does* seem to be such a limit. There is a limit, first, to the number of different pitches that our ears can discriminate between any two points of pitch; and there is a limit of a different sort to the number of notes that can be placed *musically* within a given range. Some pitches, we might say, are ‘acoustically’ next door to one another, leaving no detectable room for more; and some notes are ‘musical’ next-door neighbours, leaving no room between them for others that can be used in the same melodic sequence. Either or both of these observations might be explained on the basis of the thesis attributed to Lasus and the Epigoneioi, that a note or a pitch is not after all a dimensionless point, but has ‘breadth’ and occupies some space; some number of notes or pitches will then ‘fill up’ all the space available.

We must be duly cautious about this interpretation, whether it refers to acoustically perceptible pitches or, as Aristoxenus’ formulation seems to imply, to musical notes (he says that breadth was attributed to notes, φθόγγοι, not to pitches, τάσεις). If the thesis goes back to Lasus, it was conceived well before the time of Zeno and the Eleatic paradoxes, and the intellectual world was perhaps not yet ready for very sophisticated reflections in this area. But the cap seems to fit, in a rough and ready way, and we may reasonably wonder whether it has anything to do with Theophrastus’ polemic. Notes, according to the picture it presents, are differentiated from one another by their own bulk, which compels them to occupy different places in pitch. A critic might well fasten on the apparent implication that if a sequence of adjacent notes is played or sung, and if the ‘breadths’ of its notes fill up all the available space, then the sequence must include the entire continuum of pitches within its range, and as such will be ‘unmelodic’.

In truth, however, the connection seems tenuous. Crucially, this hypothesis does not account for Theophrastus’ identification of his opponents as those who hold that pitch-differences are caused by the διαστήματα. The fact that they do so is not just a casual aspect of their approach; as Theophrastus presents them, it is their brand-image, the banner under which he makes them march. But we have no evidence that Lasus or the Epigoneioi talked about διαστήματα at all, and it is in any case most improbable that these people could be picked out precisely as those who say that διαστήματα are the causes of pitch-differences; their salient peculiarities are of quite another sort. I conclude that we have not yet run Theophrastus’ quarry convincingly to earth.

The second passage which might have some bearing on the issue comes in Chapter 6 of the *De sensu*.<sup>13</sup> It is part of Aristotle’s discussion of the question whether perceptible qualities, like the bodies to which they belong, are divisible εἰς ἄπειρον; it is a question which I think

<sup>13</sup> My thanks to Richard Sorabji for persuading me to give this passage closer attention. The discussion that follows did not form part of the paper presented at the colloquium; it is prompted by his comments on that occasion and later in correspondence. Except where noted, however, the responsibility for its peculiarities and failings is entirely my own.

he construes in more than one way, but I cannot pursue that complication here. At the beginning of the chapter he offers powerful reasons for concluding that they are so divisible, at least in the sense that no portion, however small, of a quality's extension in a body can be imperceptible (445b3-17). A little later, in order to deal with the apparent difficulty that very small amounts of a quality cannot in fact be discriminated by the senses, he introduces the distinction between potential and actual perceptibility. Taken by itself, a minute trace of such a quality cannot be perceived, but it is nevertheless potentially perceptible, in the sense that when several such amounts are aggregated, the whole is actually perceptible (446a4-20).

The passage we need to consider is 445b29-446a4, which serves as a preface to Aristotle's remarks about potentiality and actuality. After announcing the need to take note of this distinction, it continues: 'It is because of this that the ten-thousandth part of a millet-seed which is seen escapes us (*λανθάνει*), even though our sight has encountered it [or perhaps 'traversed it', *ἐπελήλυθεν*], and the note inside the diesis escapes us (*λανθάνει*), even though our hearing<sup>14</sup> hears the whole *μέλος* being continuous;<sup>15</sup> and the *διάστημα* between the intermediate and the extreme notes<sup>16</sup> escapes us (*λανθάνει*).'

These pronouncements pose a number of problems, and I cannot undertake to resolve them all. For our purposes the crucial moment comes with Aristotle's reference to 'the note inside the diesis' (*ὁ ἐν τῇ διέσει φθόγγος*), where he is evidently taking the diesis to be the smallest interval that hearing can distinctly identify (cf. above n. 9). Aristotle is apparently telling us that there is a (potentially perceptible) note between the boundaries of this interval, even though we cannot actually hear it as a distinct note. He seems clearly to imply that it is related to what we actually hear in precisely the way in which the ten-thousandth part of a millet-seed is related to the whole seed; we cannot perceive the minute part as such, even though we perceive, in its entirety, the whole of which it is a part.

The notion that Aristotle intends a close analogy between his visual and acoustic examples is very strongly encouraged by the deliberate and detailed parallelism between the clauses of the two parts of the sentence. If that indication is reliable, he must be conceiving the note inside the diesis, like the ten-thousandth part of the millet-seed, as part of a perceptible whole. But the clause which should apparently identify the whole in question is hard to interpret: *καίτοι συνεχούς ὄντος ἀκούει τοῦ μέλους παντός*. This would most naturally be taken to mean 'although hearing [see n. 14 above] hears the whole *μέλος*, which is continuous'. But this interpretation runs into an immediate difficulty. In performing a *μέλος*, if Aristotle is using this word in its usual sense, the singer or player – as we saw earlier – will move from one note to the next without sounding any of the (theoretically available) notes or pitches between them. Specifically, he will not sound any 'note inside the diesis', and this potential or hypothetical note will not after all form any part of the whole phenomenon that is presented to our ears. The *μέλος* will be continuous only in the sense that its notes follow

14 No subject for the verb *ἀκούει* is expressed; I assume that we are to understand *ἡ ἀκοή*, parallel to *ἡ ὄψις* in the corresponding clause about the millet-seed.

15 This clumsy translation of *συνεχοῦς ὄντος* is intended to hold the phrase's interpretation in abeyance; it will be discussed below. The noun *μέλος* has been left untranslated for the same reason.

16 The noun *φθόγγοι*, 'notes', is not in the text, but can confidently be supplied; *φθόγγος* has appeared in the phrase 'the note inside the diesis', and nothing else in the vicinity can explain the masculine gender of the adjective *ἐσχάτους*, 'extreme'.

one another in a continuous temporal and melodic sequence, not in the sense that it includes the entire continuum of pitches between its highest and its lowest notes.

As an alternative, we might try the hypothesis that Aristotle means ‘although hearing hears the whole μέλος *as* being continuous’. That is, in the melodic sequence in question, the pitches of the notes are so close together that they are perceived as next-door neighbours, with no space between them into which another could be fitted.<sup>17</sup> This is perhaps a forced reading of the text. Editorial intervention could easily make it more plausible, either by inserting ὥς before συνεχούς, or by postulating (not entirely implausibly) that ἀκούει should be emended to ἀκοῇ, giving the sense ‘although the whole μέλος is continuous to the hearing’, that is, although it strikes the ear *as* continuous. But these are desperate measures, and in any case they would not produce the desired result. The fact, if it is one, that the notes of a sequence are heard *as if they were* adjacent to one another will do nothing to provide us with the genuinely continuous whole of which the ‘note inside the diesis’ is a part. The apparent continuity of the μέλος will be no more than an illusion.

The continuous whole we are pursuing must evidently be identical with Aristotle’s μέλος. But it will contain the ‘note inside the diesis’ as a part only if it is after all not a ‘diastematic’ μέλος of the familiar sort. It must be a movement of the type which Aristoxenus and others (above n. 6) treat as alien to music, one that slides ‘continuously’ between its pitches; in short, it is a *glissando*.<sup>18</sup> In the scenario which Aristotle envisages, the singer’s voice, or the instrument’s sound, would glide smoothly across the continuum of pitch between the boundaries of the diesis, leaving no gaps; but the listener would detect only the notes on which the movement began and ended. This interpretation makes the text intelligible, but the objection that it faces is both serious and obvious. The difficulty is not that μέλος cannot actually mean ‘*glissando*’, though certainly it cannot, or that there is no other text which attempts to convey that meaning, in a musical context, by qualifying a μέλος as ‘continuous’, though there is none; it is that the noun is regularly used in such contexts to designate, quite specifically, a mode of sound-production from which slithers and slides of this sort are rigorously excluded. Types of μέλος which display this kind of ‘continuity’ are characteristic of speech, and are wholly excluded from the domain of musical melody.<sup>19</sup> It is very hard to see how Aristotle’s original readers could have understood his words in the sense that this interpretation of the passage requires.

I should like to suggest, very tentatively, a way in which the problem might be resolved. Musical writers use the noun δίεσις to refer to any very small interval; but it refers most commonly to the interval – approximately a quarter-tone – which lies, paired with another

17 A quite different, strictly musical application of the adjective συνεχής, ‘continuous’, is expounded by Aristoxenus at various points in the *El. harm.*, notably at 27.15–29.1 (cf. 52.33–53.32). But it can hardly be relevant here. In Aristoxenus’ sense, the notes of any complete musical scale, for instance, will be melodically ‘successive’ (ἐξήης) with one another, and from a musical perspective the sequence will be ‘continuous’, συνεχής, despite the fact that the interval between one note and the next will in some cases be as large as two whole tones (see especially 60.10–61.4). The fact that one note strikes us, in its scalar context, as in this sense the ‘natural successor’ of another, has no bearing, so far as I can tell, on Aristotle’s argument.

18 This is a hypothesis which in the past – for reasons indicated above – I had not considered sufficiently seriously. I am grateful to Richard Sorabji for making me think again; he cannot be blamed for the uses I am about to make of it.

19 To the passages mentioned in n. 6 above we may add Ptolemy *Harm.* 67.10–12, which describes such ‘continuity’ between pitches as τὸ ἐκμελέστατον εἶδος περιέχουσιν.

of similar size, at the bottom of a tetrachord in the enharmonic genus.<sup>20</sup> Structures of this sort were particularly characteristic of the music of tragedy, and of certain other genres in which the principal instrument, as in tragedy, was the aulos.<sup>21</sup> Very probably it was this 'enharmonic' diesis that Aristotle had in mind, since it was the smallest interval used in Greek music; and he may therefore have been thinking, in particular, of the way in which an enharmonic μέλος was played by a performer on the pipes. Now etymologically, and in non-musical contexts, a δῖεσις is not a gap or a space comparable to an interval. The noun signifies an action, that of 'putting through' or 'letting through'. In connection with music it was originally, perhaps, the act of 'letting the sound through' from one note to another that lay close by, allowing it, as it were, to trickle down or slide up across the small intervening space without interruption. An aulete could – and probably sometimes would – achieve this without even moving his fingers, simply by slackening or increasing the pressure on the reeds of the mouthpiece, which were held between his lips. The note upon which he ended would not be individually articulated by separate 'tonguing', but would appear to emerge seamlessly out of the first note, without any perceptible phase of transition.<sup>22</sup>

Practices of this sort would give Aristotle the picture he needs. This reconstruction of the background to his remarks remains thoroughly hypothetical, but it makes sense of a passage which seems otherwise impenetrable, and it is the best I can devise. The question we have to ask, however, is whether it allows Aristotle's discussion to be plausibly connected with the theory that Theophrastus criticizes; the answer, as it seems to me, is that it does not, for at least two compelling reasons. First, the suggestion I have made applies only to the very special case of the enharmonic diesis; it carries no implication that intervals of any other sort in a μέλος were conceived, or perceived, as being 'filled up' with sonorous content. There is nothing here to suggest a general theory about the nature of διαστήματα, of the kind with which Theophrastus is apparently concerned. Secondly, on any interpretation of the passage, Aristotle shows no sign of treating a διάστημα as being constituted by the totality of the notes or pitches that may lie between its boundaries. He clearly distinguishes the note (φθόγγος) from the diesis within which it is located, and the διάστημα from the 'intermediate' and 'extreme' notes between which it falls. Just as in Aristoxenus, a διάστημα

20 A scale covering the span of an octave is typically analysed by the theorists as made up of two four-note subsystems ('tetrachords'), each spanning a perfect fourth, which are separated by the interval of a tone. The sizes of the intervals between the notes of a tetrachord are variable, and scales are classified into 'genera' (diatonic, chromatic and enharmonic) on the basis of these variations, with particular attention to the size of the tetrachord's highest interval. To simplify a rather complex matter, scales in which this interval is relatively small are diatonic, those in which it is largest are enharmonic, and those where its size is intermediate are chromatic. As Aristoxenus analyses it, the perfect fourth spanned by any tetrachord amounts to two and a half tones, and in an enharmonic scale it is divided, from the top down, into intervals of a ditone (roughly a 'major third'), a quarter-tone, and a quarter-tone. For a little more detail see Andrew Barker, *Greek Musical Writings*, above n. 10, 11-13, and for fuller discussion see West, *Ancient Greek Music*, above n. 10, 160-72.

21 On the prominence of enharmonic music in tragedy see *Pap. Hibeh* 1.13, Plut. *Quaest. conv.* 645e, Psellus *De trag.* 5; there are striking examples of its use of quarter-tones in the famous fragment from Euripides' *Orestes*, *Pap. Vienna* G2315, printed and discussed in Egert Pöhlmann and Martin L. West, *Documents of Ancient Greek Music* (Oxford 2001) 12-17. On the origins of the enharmonic in a different genre of music for αὔλοι see [Plut.] *De mus.* 1134f-1135b, 1137b-d.

22 For a variant on this suggestion see West, *Ancient Greek Music*, above n. 10, 235 n. 42.

is a gap or space which is bounded by two notes, and within which other notes may be placed; the space and its actual or potential contents are conceptually quite distinct.

It turns out, then, that this excerpt from the *De sensu* is irrelevant to our concerns, but I make no apologies for spending time on it, and not merely because its intricacies are intellectually alluring in their own right. At first sight it looked like a promising candidate for the role we are attempting to fill, and clearly deserved to be short-listed; we could not responsibly have eliminated it from the field before its credentials had been examined. It was the second of the three passages I ear-marked for consideration, and we must now turn to the third.

Ever since I started to mention notes that are next-door neighbours, and minimal intervals and units of measurement, readers will have been waiting with keen anticipation, or perhaps with a sense of doomed inevitability, for some comments on a very well known passage in the seventh book of the *Republic*. Its moment has arrived. At 531a-b Glaucon mistakenly supposes that the harmonic theorists whom Socrates has mentioned are those who ‘call certain things πυκνώματα and intently incline their ears as if trying to detect a voice from next door, some of them saying that they can still just hear a sound, τινὰ ἤχην, in between, ἐν μέσῳ, and that this διάστημα is the smallest, by which measurement should be made, while others disagree and claim that the sounds are already uttering the same pitch; and both of them are putting their ears ahead of their mind.’ This is the description which Socrates immediately elaborates, at 531b, with his gruesome metaphor about torturing strings, racking them on the tuning-pegs and beating them with the plectrum, about accusations, denials and the strings’ prevarications, and so on.

We need not examine the whole passage in detail.<sup>23</sup> These harmonic inquisitors are engaged in a search for the μικρότατον διάστημα, ὃ μετρητέον, and they are trying to identify it empirically, by listening attentively to what happens when they adjust the tensions of an instrument’s strings with their tuning-pegs, the κόλλοπες, until their pitches are so close together that with any further adjustment they will be heard as sounding in unison, ὅμοιον ἤδη φθεγγομένων. Glaucon and Socrates deride their procedure, and it obviously has problematic features; but there is every reason to suppose that it was attempted and taken seriously at the time of the *Republic*’s dramatic date, in the late fifth century. It is clearly connected with the practice of measuring intervals by reference to a minimal perceptible unit which is mentioned by Aristotle, and a version of which was used by the theorists whom Aristoxenus calls ἁρμονικοί.

For our purposes the crucial moment comes at 531a6-7. When they listen to the notes emitted by two strings tuned to closely adjacent pitches, some investigators ‘say that they can still just hear (κατακούειν) some sound in between, and that this διάστημα is the smallest, by which measurement is to be made’. The general point is clear, but it is not expressed in quite the way we would expect. These people are asserting that the pitches of the two notes are very slightly but perceptibly different, and the claim would most naturally be put by saying that they can still hear a difference between them, or, in terms of διαστήματα, that they can still detect a gap or space which separates them. According to Glaucon, however,

<sup>23</sup> An admirable recent discussion of the whole passage on harmonics in the *Republic* is A. Meriani, ‘Teoria musicale e antiempirismo’, in *Platone: la Repubblica*, ed. Mario Vegetti, vol. 5 (*Elenchos* XXVIII-5, 2003), 565-602; for his study of the portion we are considering see 569-74.

they say that they can still hear a *sound*, τινὰ ἤχην, 'in the middle', and that 'this διάστημα is the smallest' or perhaps that 'this is the smallest διάστημα'. If we take Glaucon's formulation at face value, the smallest διάστημα is, strangely, being identified with the 'sound in the middle'. It is not specified as a linear distance or gap.

A possible connection with Theophrastus now leaps immediately to the eye. His attention is directed to people who say that the διαστήματα are the causes of pitch-differences, and who represent a διάστημα as the sonorous content of the range of pitch that lies between one note and another. The phrasing of the passage in the *Republic* makes it appear, at least at first glance, that Glaucon's theorists are doing something of much the same sort. The two notes are different because there is a *sound* between them, not a gap, and it is this intervening sound that 'is' the διάστημα.

All this seems very peculiar. We have examined the only two other passages where one might hope to find traces of a comparable view, and have found none; and there is nothing similar anywhere else in fourth-century literature outside Theophrastus, or even in later writings. I would reckon it likely, and not just a lazy hypothesis, that there never was a theory of quite this sort. Glaucon's mode of expression is in fact ambiguous, and the interpretation I have so far placed on it is by no means compulsory. The procedure outlined in Glaucon's and Socrates' speeches at 531a-b apparently involved tuning two strings to pitches which are very closely adjacent, but are unanimously recognised as distinct, and then lowering the pitch of the higher string slightly, or raising the pitch of the lower, adjusting the string's tension by means of the tuning peg. At this point some of the investigators assert that the pitches of the two strings are now identical, while others claims that the pitch of the string that was adjusted is now 'in between', that is, in between the pitches of the two original notes. When they add that 'this διάστημα is the smallest, by which measurement should be made', they are expressing themselves elliptically; they mean that the διάστημα between the pitch of the adjusted string and the pitch of the other is this 'smallest interval'. Their view is implicitly contrasted with that of the researchers with whom they are in dispute; the latter must hold that the smallest interval is the one which lay between the pitches of the two strings before one of them was re-tuned, since they claim that this tiny adjustment has brought them into unison.

I cannot claim any privileged access to Plato's intentions, or to the construction which he expected his readers to put on Glaucon's words. I am virtually certain, however, that on the first interpretation I offered, Glaucon would be misrepresenting the position of the theorists whose procedures he is (rather casually and contemptuously) sketching. The fact remains, however, that his statement is ambiguous, and that readers might be forgiven for construing it in this peculiar and (I think) misleading way. We might argue about whether Plato has been careless, or has deliberately added to his characterization of Glaucon by putting a confused form of words into his mouth, or is simply attempting to make these empirical investigators look even more absurd than they really were. That is not important here. But the unique oddity of this passage's phraseology makes room for a hypothesis about Theophrastus. The view he attacks has close affinities with the one spelled out in our first, probably mistaken interpretation of Glaucon's speech, and in crucial respects it cannot be matched with any theoretical position that is found elsewhere. We may reasonably wonder, then, whether the thesis against which he directs his fire-power is one that he has constructed entirely out of his reading of Glaucon's words in the *Republic*. If that were true, we would have to conclude

either that he knew nothing about the real exponents of empirical harmonics in the fifth and fourth centuries – though he was well informed about the work of harmonic theorists in the other, mathematical tradition – or else that he had other information about them, but chose, arbitrarily and wrongly, to interpret their approach in the treacherous light of Glaucon's eccentric description, construed in just one of the two ways that are linguistically possible.

This diagnosis might lead us to guess that Theophrastus was not very interested in this variety of harmonic theory, and that as a result, he formulated his criticisms with insufficient care. It would be a depressing conclusion, but it gets some support from a more general feature of the fragment as a whole. Porphyry's quotation runs to 126 lines in Fortenbaugh's edition, of which 102 are devoted to criticisms and corrections of the mathematical theorists, compared with only just over sixteen for those who maintain that the διαστήματα are the causes of pitch-differences. It is a massive imbalance; mathematical harmonics receives six and a half times as much attention as empirical harmonics, and the lines dealing with the latter seem little more, in fact, than a perfunctory appendix. Probably we ought not to be surprised. Aristotle knew a little about empirical harmonics, but there is no evidence that he knew very much, and he made no significant use of it himself. Plato refers to it explicitly only once, in our passage of the *Republic*, and then to mock it. Both of them find much more philosophical mileage in the mathematical approach to the subject. If Aristoxenus is a good guide, just about all worthwhile empirically-based studies had been undertaken long ago, back in the fifth century, and even the best of them had terrible flaws. In the fourth century the discipline had no serious intellectual profile until it was reinvented by Aristoxenus himself, in the up-to-date guise of an Aristotelian natural science. If, as I believe, Theophrastus did not have Aristoxenus in his sights, he will have had precious little of any substance to examine – except the colourfully satirical account in the *Republic*.

We must leave this intriguing but probably unresolvable problem there. Earlier in the paper I raised a second question. If Theophrastus was not attacking Aristoxenus, he may nevertheless have known something of his work, or at least have been familiar with some of the ways in which he talked about issues in harmonics. Does the text offer any evidence that he did? I shall deal with the question very briefly. Two features of Theophrastus' discussion may carry traces of Aristoxenus' influence. One is linguistic; key elements of the musical vocabulary used in this passage seem to be borrowed from Aristoxenus' repertoire. They include διάστημα itself, though of course this is common elsewhere; ἐμμέλεια and ἐκμέλεια, which are the pivots of a crucial and often repeated contrast in the *Elementa harmonica*; the expression τὸ συνεχές, used in this particular way; and τόπος, used to refer to a designated range of pitch. We may note also the word μελωδία in line 120, which, as I shall try to explain shortly, is not just an equivalent of μέλος in lines 115 and 122; the rather subtle distinction between the two reappears in Aristoxenus.

The second probably Aristoxenian ingredient is one that I have mentioned already, the distinction between two sorts of vocal movement from pitch to pitch, in one of which, that of singing, the continuum of pitch between two different notes is passed over silently, while in the other, that of speech, wolf-howlings and the rest, the voice slides audibly across the contents of the intervening range. The distinction may seem too obvious to bear a specifically Aristoxenian trade-mark, but it is a fact that Aristoxenus presents it as one that has never

before been properly understood and explicated, and with one single exception, he devotes more space to it in Book 1 of the *Elementa harmonica* than to any other topic.

Certainty on this issue is impossible, but I think we have a reasonable probability. Theophrastus is deploying a bundle of linguistic resources, and one important insight, which he has borrowed from his colleague in the Lyceum. I shall leave the matter there, and end with an attempt to disentangle some difficulties in the part of this passage of which I have so far said nothing. We can ignore the last few lines, from halfway through line 122 to the end; they merely repeat what has already been said. But lines 120-22 need attention.

Line 120 poses an unavoidable textual problem. If we retain the MSS reading ταύταις, as I did when reviewing the fragment for the Fortenbaugh edition, the sense must be: 'It is therefore a great help that μελωδία revolves around (or 'depends upon', περιστάσθαι) these (ταύταις)', where 'these' are the things designated by the only relevant feminine nouns in the vicinity, ἐμμέλεια and ἐκμέλεια. There are two difficulties. First, as Alexanderson and Sicking have pointed out,<sup>24</sup> there are no good parallels for this sense of περιστάσθαι elsewhere in Greek literature, certainly not with a dative complement; the instances closest in meaning that I can find (and they are not really very close) all use περιστάσθαι εἰς, with an accusative. This objection may not be fatal, but it is a little uncomfortable. Secondly, the thesis would be that when, as the next part of the sentence puts it, we are trying to find the notes that are attuned to one another, it is a great help that μελωδία turns upon the distinction between the melodic and the unmelodic. This is not unintelligible, if we assume that the status of an interval or a note as melodic or unmelodic, in its musical context, is something that springs readily to the musical ear. In looking for notes that are suitably attuned to one another, as we sing through a musical sequence, we do not rely on estimates of the quantitative relation between one note and another, but on our sense of what is melodic and what is not. It is a comprehensible position; as it stands it is rather vague, but it could be elaborated and clarified on the basis of Aristoxenian theory, and in a general way it seems consistent with Theophrastus' views. The problem is that it is completely unprepared for, undeveloped and unsupported by anything else in the passage. It would be the merest snippet of an idea, with nothing to link it into its surroundings.

Alexanderson suggested a simple emendation: ταῦτα εἰς for ταύταις. We can now give περιστάσθαι a sense that has parallels elsewhere, 'to avoid', and the statement will mean: 'To avoid these things is therefore a great help εἰς τὴν μελωδίαν'. I shall return to μελωδία immediately. 'These things' will be the διαστήματα, conceived in Theophrastus' peculiar way as the content of the ranges of pitch between the melody's notes. Avoiding that intervening material helps us to locate the notes that are attuned to one another, presumably because our powers of discrimination are not confused by irrelevant, unmelodic noise. Whatever construction we place on this, it has at least the merit of staying close to themes already embedded in the passage, and the only immediate objection to Alexanderson's emendation is that the sense 'to avoid' for περιστάσθαι is attested only in later Greek, beginning with Philodemus. I would like to be able to follow Sicking's ingenious suggestion that Theophrastus is alluding to the way in which melodic notes 'stand around' (περί) the διαστήματα, with a side-reference to Aristoxenus' use of ἵστασθαι for the voice's 'standing

24 B. Alexanderson, *Textual remarks on Ptolemy's Harmonica and Porphyry's Commentary* (Göteborg 1969); Sicking, 'Theophrastus on the nature of music', above n. 4.



at rest' on the musically appropriate pitches. But I fear that this is packing a good deal more into the words of the text than its syntax and semantics can sustain.

No firm and final conclusion can be reached about these textual puzzles, though I myself am now rather more inclined to accept Alexanderson's emendation than I used to be. But we need to ask in a broader spirit what Theophrastus is asserting in this sentence. What exactly does he mean by something's being a great help εἰς τὴν μελωδίαν, if that is the true text, and by our being enabled to 'find', ἀνευρίσκειν, the notes that are attuned to one another? Here at last we have a question with an answer. As he works towards the close of the passage he is referring back to the observation he made right at the start, where he comments on the extraordinary accuracy with which the soul can audibly express its κίνημα μελωδητικόν, its 'melody-making movement', through the medium of the voice. It is from this point, as I said at the outset, that the argument of the passage sets off, criticizing what Theophrastus takes to be various people's views about the way in which this melodic accuracy is achieved; and now the issue resurfaces.

What we are represented as trying to do at lines 120-21 is just what the soul was said to do at the beginning, that is, to 'find' the appropriately attuned notes in a way that enables us to produce them in sound and sing a melody. The fact that this 'finding' is not merely theoretical, but is done in practice with the voice, is reflected, whichever version of the text we follow, in Theophrastus' use of the word μελωδία, rather than the simple μέλος which appears in lines 115 and 122. Sometimes, to be sure, the two words seem interchangeable; but in certain passages in musical writings there is a detectable and apparently deliberate difference. A μέλος is most commonly a melody, conceived as a musical entity which one might sing or play; and in theoretical writings the noun is quite often used to designate a universal, melody in general. But when distinctions of meaning are in the air, μελωδία has a rather different semantic penumbra. It can be used, as it is by Aristoxenus, in a sense that is tied more closely to an activity, the activity of μελωδεῖν, singing or 'making melody'; Da Rios in her index to Aristoxenus glosses it as *'ars conficiendi vel canendi melodiam'*. I am not wholly convinced by that *'ars'*; μελωδία is more of a 'doing' than an art or a skill. But *canendi melodiam* is certainly in the right target-area. This is tolerably clear at *El. harm.* 27.19-20, where μελωδία and λέξις designate the activities of singing and speaking respectively. It is crucial at 28.20-28, where it is said to be in the nature of μελωδία, melodic singing, that the voice places its intervals in certain orders 'in accordance with μέλος', and where the allusion to μελωδία is further developed by reference to the notes that the voice is capable of singing, μελωδήσαι. This rather intricate passage makes it clear that μελωδία is an activity, the voice's actual movement through notes and intervals, whereas μέλος (in this instance) is an abstract 'essence' to whose principles μελωδία naturally conforms (cf. also 53.21-25). Theophrastus, I think, has adopted the same usage, and his claim, if Alexanderson's emendation is accepted, is simply that leaving out the διαστήματα is a great help to us when we are trying to make melody, to sing.

I do not think that Theophrastus is trying to explain how it is that we succeed in uttering precisely the notes that are needed for the particular, well-tuned melody that is moving in our soul. So far as I can tell he has no such explanation. Here, at any rate, he is still working in a critical vein, and is bringing out the fact, as he sees it, that the task of locating the right notes in our efforts at μελωδία is facilitated by the omission of the διαστήματα. It is the

notes that are responsible for the μέλος, he goes on, but he has no clear positive thesis to offer about how we find them; he is still beating the same negative drum as before. If the διαστήματα are made evident, ἐπιδηλούμενα, as we embark on the activity of μελωδία, they get in the way of the μέλος rather than helping in its production, and are the causes of ἐκμέλεια rather than ἐμμέλεια. They are obstructive hindrances to our quest for the melodic. Hence, once again, the διαστήματα-theorists are wrong. The pitch-differences between the notes of a melody are not created by the presence of the διαστήματα between them, and we do not make or find the various notes by giving voice to the pitches that those διαστήματα encompass.

Taken as a whole and construed in the way I have suggested, the passage we have been examining makes sense, an eccentric kind of sense, perhaps, but sense none the less. Armed with a handful of Aristoxenian conceptions, Theophrastus has succeeded in making mincemeat of the theory at which his comments are apparently aimed. But unless I am much mistaken, the theory is not that of Aristoxenus, or of the precursors whose work Aristoxenus discusses, or of those mentioned by Aristotle, or, I believe, of anyone else with a decent claim to historical reality. I am not wholly committed to the notion that it was dragged into existence on the coat-tails of a stray phrase put by Plato into the mouth of his unfortunate brother Glaucon, Socrates' willing but confused respondent. If that is true, the only person we know of who interpreted the phrase in the necessary way, gave that interpretation a moment's serious attention, and took the trouble to work out its absurd implications, was Theophrastus himself. But if it is false, I have no idea who the real objects of Theophrastus' assault could be, unless, after all, he was intending to criticize Aristoxenus or his predecessors while labouring under an absurd misapprehension about what they meant.

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